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Work and Leisure in Hawaii Small Boat Pelagic Fishing

by

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A thesis submitted in partial fulfillment
of the requirements for the degree of

Master of Marine Affairs

University of Washington

1996

Approved by _____
Chairperson of Supervisory Committee

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Program Authorized
to Offer Degree _____

Date _____

University of Washington

Abstract

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Fishery managers need to understand the social structure of the various user groups of a fishery to make informed management decisions regarding conservation and allocation. Hawaii's small boat pelagic fishery is composed of many types of fishing activities that are inadequately described by the bureaucratic definitions of commercial and recreational fishing. Exploratory ethnographic research reveals that Hawaii fishing contains elements of work and leisure. The work is often expressive rather than instrumental, and the leisure is often serious rather than casual. Expressive work and serious leisure allow participants to satisfy both physical and intellectual desires, and maintain positive emotional states. Using these sociological distinctions of work and leisure, this thesis expands upon the bureaucratic categories of commercial and recreational fishing to develop seven categories that more accurately portray the range of activity in the Hawaii fishery.

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LIST OF ACRONYMS

CML	Commercial Marine License
DBOR	Division of Boating and Ocean Recreation
DLNR	Department of Land and Natural Resources
DOT	Department of Transportation
EEZ	Exclusive Economic Zone
FMP	Fishery Management Plan
HDAR	Hawaii Division of Aquatic Resources
JIMAR	Joint Institute of Marine and Atmospheric Research
MFCMA	Magnuson Fishery Conservation and Management Act
NEPA	National Environmental Protection Act
NMFS	National Marine Fisheries Service
NOAA	National Oceanic and Atmospheric Administration
OY	Optimum Yield
PPFRP	Pacific Pelagic Fishery Research Program
PPMUS	Pacific Pelagic Management Unit Species
SIA	Social Impact Assessment
WPRFMC	Western Pacific Regional Fishery Management Council

ACKNOWLEDGMENTS

I thank my thesis committee for their concern, guidance, and time: Marc Miller, as professor, mentor, colleague, and committee chairman, inspired and guided my research and sharpened my eye for the profound and the absurd. Dave Fluharty provided timely and invaluable ideas and editorial comments from 2000 miles away. Sam Pooley, as my supervisor at the National Marine Fisheries Service and my only on-site committee member, kept me grounded in the realities of fishery economics and management.

I am especially grateful to Michael Laurs, the National Marine Fisheries Service Southwest Fisheries Science Center - Honolulu Lab, and the Joint Institute for Marine and Atmospheric Research for making this study possible.

I also thank the many people who helped me to understand Hawaii style fishing: The many fishermen, for sharing their fishing experiences; Marcia Hamilton and Steve Huffman, for allowing me to tag along on survey missions; William Aila, for sharing his passion for fishing, his first hand knowledge of fishermen and fishery management, and most of all, his *aloha* spirit; Michael DeRego and all the Inter-Island Sport Fishing gang, for sharing their world with me - Nina, Chris, Eric, Kevin, Brian, Darren, Captain Toots, and Rick; and David Itano, for always taking the *pau hana* time to tell fishing tales.

I also thank Marcia Hamilton, David Itano, Nina Hadley, and Michael Guilbeaux for their reviews and suggestions; and Brangien Davis and Leanna Bartram for editorial help.

Mahalo!

1.0 INTRODUCTION

This thesis is a socio-cultural study of the Hawaii small boat troll and handline fishery. Its particular purpose is to develop a conceptual framework for understanding the human component of this fishery. The basis for understanding the fishing experiences and the social structure of the fishery is found in instrumental and expressive work, and casual and serious leisure. I develop seven categories of Hawaii small boat pelagic fishing, and analyze them in terms of work and leisure. This analysis will help fishery managers in assessing the socio-economic measures of effort, making fair allocation decisions, and understanding the human dimension of the Hawaii troll and handline fishery. This chapter provides an introduction to the fishery and explains the methodology of the thesis. Chapter two outlines the U.S. federal legal mandates and mechanisms for incorporating social science research into fisheries management, and the Council's social science specific research priorities in this pelagic fishery. Chapter three explains how recreational and commercial fishing have been defined by various federal and state governmental entities, and defines the seven categories of Hawaii pelagic fishing. Chapter four introduces the concepts of work and leisure, and explores how expressive work and serious leisure often become central life interests. Chapter five describes each type of fishing and defines the elements of instrumental and expressive work and casual and serious leisure in each fishing category. Chapter six concludes with a discussion of the significance of findings, and implications for fishery management.

1.1 Defining a Fishery

A fishery can be defined as the interaction of a fish population and a human population (Miller and Francis 1989). Depletion of fish stocks in recent decades has alerted humans of the need to "manage" that relationship to ensure the viability of future fisheries. Because fishery managers influence fish populations by controlling human actions, fishery management can more accurately be defined as "people management." Management of people in fisheries is complicated by the fact that people hold different values, expectations, preferences, lifestyles, and goals. The human component of a fishery can be viewed as having four primary stakeholder groups: consumers, harvesters, distributors and fishery managers (Miller 1995, 7). All of these groups interact to some

degree, have particular behavioral patterns, and share describable traits. The functions of individuals and groups and the uses and varied satisfactions from fishing are all part of the "human dimension" of a fishery (Orbach 1980, 149).

The legal mandate for socio-cultural studies on US fisheries is an acknowledgement of the importance of the human dimension in fisheries. The Magnuson Fishery Conservation and Management Act of 1976 (16 U.S.C. 1801 et seq.) mandates that social and cultural aspects of fisheries be examined by the eight regional fishery management councils in their decision-making processes. Despite this mandate, the actual processes by which and the extent to which this information reaches the councils varies from region to region. The process and mechanisms for incorporating socio-cultural information into fishery management plans under the Magnuson Act are not formally institutionalized, and thus have been applied irregularly (Fricke 1985, 49).

1.2 Hawaii's Troll and Handline Pelagic Fishery

This thesis is a sociological study of the harvesting element of the small boat troll and handline fishery for pelagic, or open ocean, species in Hawaii.[1] This fishery involves 1,837 resident licensed commercial marine fishermen, an estimated 2,000 to 4,000 resident fishermen without commercial licenses,[2] and an unknown number of visiting fishermen from the U.S. mainland.[3] These fishermen use boats ranging in length from 8-61 feet to target offshore species with troll or handline gear. Trolling involves towing lures or baited hooks behind the vessel at speeds between 4 -10 knots, and mainly targets dolphinfish (mahimahi), wahoo (ono), blue marlin(a`u), striped marlin (kajiki), skipjack

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[1] In this thesis, I use the term "fisherman" to describe any person who fishes, whether female or male, because it is consistent with local usage. This does not exclude women who fish.

[2] There is no marine recreational fishing license in Hawaii. In 1984, a survey of Hawaii boat owners found 5,084 who claimed to use their boats for fishing (Skillman and Louie 1984). The number of fishermen with commercial marine licenses that year was 2,940.

[3] One study (Samples et al. 1984) estimated 73,780 patron trips on charter boats in Hawaii in 1982.

tuna (aku), and yellowfin tuna (ʻahi).[4] Handline fishing occurs in the daytime (palu-ahi) or nighttime (ika-shibi), and targets large yellowfin and bigeye tuna (ʻahi) (Boggs and Ito 1993, 74).[5] Some boats are kept in harbors and some are trailered.[6] Fishing occurs throughout the year, with participation intensifying during the summer months when many pelagic species aggregate to feed and spawn close to the islands, and decreasing in the winter when surface waters cool and strong southerly Kona winds make for rough seas.

This thesis responds to the Magnuson Act mandate to consider social and cultural factors in fishery management policies. The management element of the fishery includes both the Western Pacific Regional Fishery Management Council (the Council) and federal and State of Hawaii entities. Because most pelagic fishing occurs beyond three nautical miles of shore, the Council is responsible for managing the fishery within the framework of the Magnuson Act. However, other state and federal entities have management authority over activities related to pelagic fishing. The U.S. Coast Guard licenses vessels over five net tons and inspects commercial fishing vessels for safety requirements. The National Marine Fisheries Service (US Department of Commerce, National Oceanographic and Atmospheric Administration) collects fisheries data for the Council and enforces fishery management plans. The State of Hawaii Department of Land and Natural Resources (DLNR), Division of Aquatic Resources (HDAR) issues commercial marine licenses and collects monthly catch reports. Also in the DLNR, the Division of Boating and Open Recreation (DBOR) registers boats under five net tons as either recreational (HA) or commercial (CF). The Department of Transportation (DOT) maintains harbor facilities, including launch ramps.

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[4] Throughout the thesis, I have used the common name followed by the local name in parentheses to identify fish.

[5] For further description of pelagic fishing methods, see Rizzuto 1977, Yuen 1979, and WPRFMC 1995a.

[6] A 1987 study of the small boat commercial fleet (Harman and Katekaru 1988) found that 75% of commercial license holders trailer their boats, while the remaining 25% keep them in harbors.

1.3 Methodology

I arrived in Hawaii in 1996 with rather vague goals for studying the socio-cultural aspects of the troll and handline fishery. A review of existing socio-economic studies on the fishery revealed that most were demographic and economic in nature. One study which discussed the fishery in socio-cultural terms (Miller 1995) provided an excellent starting point. It was immediately evident that managers had difficulty talking with authority about the people involved in the fishery; there were only rough estimates of how many boats or people were involved in the small boat pelagic fishery. The Council documents also clearly expressed a lack of common understanding about the various user-groups within this diverse fishery. People spoke of a "continuum" of recreational and commercial fishing, and yet no one had attempted to break that continuum down into categories, or types of fishing.

I saw the need to develop a typology of fishing activity that went beyond the ordinary criteria asked by fishery managers (i.e. how big is your boat, and do you sell your catch?). The initial problems I set out to solve were: Who are the people fishing and what kinds of fishing are they doing? How do they distinguish themselves from each other (what do they call themselves)? What does their fishing activity reveal about their participation in the fishery? Just as botanists or zoologists develop taxonomies and classes of plants and animals, so do sociologists develop typologies of human behavior. The former use physical characteristics and genetic similarities to form categories, while the latter use behavioral patterns, socio-economic status, or occupational similarities to form categories. The result is the grouping of similar units for further analysis.

If a long-term goal of fishery management in Hawaii is to measure the fishing effort on pelagic species in a meaningful way, then there is a need for qualitative categories of fishing to structure that measurement of effort. Forming categories, or types, involves a decision regarding what attributes of the fishing behavior are to be used as criteria for

classification. In sociological studies this could be as tangible as age, marital status, and ethnicity, or as subjective as prestige, structured behavioral patterns, and satisfaction. This classification process cannot be arbitrary. Smith warns that "initial heuristic statements are crucial; an initially incorrect splitting or lumping in terms of the occupants of a set to be analyzed can be misleading and result in research which is ultimately self-defeating to its goals" (Smith 1977, 9). Other sociologists have suggested four necessities for a systematic formulation of categories: articulation, logical correctness, adaptation to the structure of the situation, and adaptation to the respondent's frame of reference (Lazarsfeld and Barton 1951, 157).

Much of the sociological literature on the development of categories focuses on crimes and criminals. Criminologists have struggled with the development of a "correct" typology for crime and criminals (Cressey 1951, Clinard and Quinney 1967, Liska 1974, Megargee 1977). They often frame their problem as revising classification schemes that are used in the legal systems. However, Sudnow, in his examination of a public defender's office, does not attempt to revise the existing classificatory scheme for crimes and criminals, but instead examines the process by which "normal crimes" come to be identified and assembled in daily practice of judges, lawyers, and policemen. He recognizes that the public defender learns to identify "burglars," "rapists" or "narcos" not by the actual act committed, but by the social characteristics of the type of person who regularly commits the act, the settings in which the act is committed, and the types of victims involved. He then has in his mind a "proverbial characterization" with the typical personal biography, mode of criminal activity, criminal history, and psychological characteristics (Sudnow 1964, 259-60). Sudnow makes the point that these categories of "normal" crimes are based on everyday decision-making, and thus represent practically-tested criminological wisdom. From Sudnow, I realized that the most important feature of my typology was that it created "proverbial characterizations" of "normal fishing activity" that were reflected in everyday Hawaii fishing.

In the field of maritime anthropology, Smith (1977) studied the differences between subgroups of the occupational subculture of seamen of the North American Great Lakes. She found that two distinct groups existed within the occupation of "seaman," and that the apparent homogeneity which has been assigned these two groups by outsiders was false (10). In fact, through interviews, Smith concluded that deep-water seamen and lake men had different attitudes, a different value structure, different intragroup interactions, and different vocabularies (12). Smith's study highlighted the importance of not categorizing all individuals as the same even though they use the same techniques in the same milieu. This concept reinforced the need to differentiate types of Hawaii pelagic fishing within the "commercial" and "recreational" categories.

Bryan (1977) explored this same notion among recreational freshwater fishermen, stating that a "major weakness of past research efforts has been the assumption of sportsmen group homogeneity, with variations among individual sportsmen largely unexplored" (175). He developed a conceptual framework upon the variable of recreational specialization to differentiate between trout fishermen in Wyoming, Montana and Idaho. Bryan relied on interviews and participant observation to gather data on preferences in equipment, species, water body, management, and social setting. Through these variables, he developed four categories of fishermen along the continuum of specialization in the angling experience: the occasional fisherman, the generalist, the technique specialists, and the technique-setting specialists. For each type of fisherman, Bryan was able to construct a profile of fishing orientation, management philosophy, and leisure orientation. These understandings of different fishermen help resource managers to create variability in management strategies that takes into account variability in recreational needs (186).

Also in the fishing world, Holland and Ditton (1992) explored differentiation between sportfishermen in Texas. Recognizing the wide variety of types of participants in single-recreation activities, they used a policy-capturing technique to determine which elements of satisfaction were most important to anglers. Data resulted in seven clusters of "styles"

for rating fishing trips, based on satisfaction elements such as nature, escape, sociability, challenge, learning, exploration, and catching trophy fish (29). This study offers a technique for managers to differentiate among seemingly homogenous types of fishing.

To develop my own conceptual framework of the different types of Hawaii small-boat pelagic fishing, I naturally departed from the existing bureaucratic definitions that regulate the fishery, which were limited to commercial and non-commercial. I developed classifications of Hawaii fishing from talking to and observing fishermen and fishery managers on the scene. The most obvious distinction between different points on this "continuum" from recreational to commercial fishing was the distinction of work and leisure. Studies of the sociology of work and leisure revealed the complex nature of the activities that we call work and leisure, and the spaces in our lives that they occupy. Fishing in Hawaii proved to be an ideal system in which to examine the intricacies of work and leisure.

Once types are constructed, they can be examined as ordinal, nominal, or in intervals. Ordinal categories are ranked or scaled, resulting in a comparison of categories based on one or more criteria. Nominal categories have neither value attached nor relation to each other. Interval categories are examined in relation to each other - more accurately, how closely related one category is to the other. The types I have developed for Hawaii fishing are nominal, have no value attached, and are not examined in relation to each other (although this would make an interesting study). The next step was to test the validity of the categories.

Qualitative and Quantitative Research[7]

Qualitative methods of sociology result in different kinds of data and analysis than the disciplines of biology and economics which traditionally inform fishery management.

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[7] For a list of works that guided my view of qualitative research generally, and specifically in fisheries, see *Appendix 1: Additional Readings*.

As Van Maanen et al. (1986) succinctly state in their monograph series, qualitative research does not involve counting things, "it involves counting to one"(5). Qualitative methods emphasize meanings rather than frequencies, and the nature of the activity rather than an account (5-6). However, this does not mean that qualitative research methods cannot systematically measure things. As Lazarsfeld and Barton (1951) note, "it should be realized that systematic study can be carried on...by many devices which are less precise than strict quantitative measurement but nonetheless far better than unaided individual judgement" (155). Examples include ratings, scalings, and typologies.

The qualitative research methods I used were informal interviews with key informants, structured open-ended interviews with fishermen dockside, and participant observation. The informal interviews generally lasted between 30 minutes to one and one half hours, and were preceded usually by an introduction or connection between friends. The dockside interviews were conducted in the afternoons at boat harbors on Oahu: Waianae, Hale'iwa, Heeia Kea, and Kewalo Basin. Usually fishing boats must go through an extensive and ritualistic cleaning phase after a day's fishing, and thus many interviews were conducted while water spray, fish blood, and fumes. Participant observation occurred while "hanging out" at the docks, on several fishing trips, and at social gatherings. These fieldwork methods have resulted in this ethnography of Hawaii fishing.

Ethnographies

"Ethnographies join culture and fieldwork" (Van Maanen 1988, 4). As a written representation of a culture, an ethnography is usually the result of fieldwork by a scientist in an unfamiliar culture. It may be thought of as a story of reality. Obviously, the ethnographer makes many decisions about what to include and what to omit from the ethnography. There are limitations due to personal style, assumptions, and biases. These biases can be purposeful or circumstantial. For example, women in certain ethnographic settings will be privy to different information from informants than men. Also,

ethnographers who "fit in" racially or socio-economically may assimilate into the studied culture more readily, and gain trust and access from key informants more easily. Everything about the fieldworker, in fact, conditions the character of the resulting ethnography, from personal expression, gender, word choice, skin color and academic discipline to budget constraints and timing. As Van Maanen states so sympathetically, "fieldworkers, it seems, learn to move among strangers while holding themselves in readiness for episodes of embarrassment, affection, misfortune, partial or vague revelation, deceit, confusion, isolation, warmth, adventure, fear, concealment, pleasure, surprise, insult, and always possible deportation" (Van Maanen 1988, 2).

In the case of this ethnography, I also found that the disposition of the fishermen also had a great effect on the quality of responses and the eagerness with which they responded. The clearest pattern seemed to be that people who caught fish wanted to talk and people who "got skunked" wanted to be left alone. I considered the possibility of catching the fishermen in the morning so that I could capture the anticipation and excitement of the trip and rule out this emphasis on the results of the trip. However, the early hours and the fishermen's eagerness to get out on the water prevented morning interviews. A more obvious limitation in my fieldwork, as in any fieldwork, is the truth of the fishermen's responses (I am often reminded of the bumper sticker slogan, "Early to Bed, Early to Rise, Fish all Day, Make up Lies"). This is not to say that fishermen lie, but rather to point out that the storytelling important to their culture can pose an obstacle to collecting objective, or valid qualitative data (For further discussion of reliability and validity in qualitative research methods, see Kirk and Miller 1986).

In the interviews, I presented myself as a student. As a *haole*[8] woman from the mainland, I was challenged to transcend certain biases that fishermen might have had towards me as an outsider. In many cases this proved difficult; and in others, it was easily overcome. In some cases, my gender was an asset; in others, it was a hindrance. I did not use a

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[8] *Haole* is a commonly used Hawaiian word meaning "foreigner" or caucasian.

recording device, but instead took copious field notes. I naturally did not attempt to note every detail of the encounter. For example, I was particularly not interested in what they caught that day or their fishery management complaints (which they inevitably told me). During interviews, I was trying to figure out what type of fishing trip they took that day, and what other types of trips the fishermen took on different days and how they were different. I asked questions about length of trip, gear, and people on board to determine what elements of work and leisure characterized that particular trip. I did not follow a routine sequence of questions; I tailored the questions to the interviewee's communication skills and willingness to give answers.

To analyze my data, I kept a data log of who I talked to, the location and date, and what type of trip the subject seemed to be describing to me. I encouraged fishermen to tell me about more than one type of trip, and many did. I talked to 48 fishermen who told me about 74 different trips. For the distribution of which types of fishing trips I found out about in interviews, see *Appendix 2: Interview Data*. To present my data, I have given a description of each type of pelagic fishing in Hawaii and a discussion of the elements of work and leisure in that type of fishing. I have used ideas and quotations from my field notes to illustrate these findings. The development of the typologies and the framework of work and leisure was the goal of this thesis. The counting, or measurement of the frequencies of these types of fishing remains a separate task.

2.0 SOCIAL SCIENCE IN FISHERY MANAGEMENT

U.S. fisheries management, once constrained to an examination of stock dynamics, has become far more complex in the twenty years since the passage of the Magnuson Fishery Conservation and Management Act.[9] Passed in 1976, the Magnuson Act created eight quasi-federal fishery management councils that develop fishery management plans for fisheries in their regions. The Act includes a variety of people in the fishery management process and a variety of disciplines in the decision-making process.

2.1 Legislative Mandate

A. Magnuson Act

The Magnuson Act's introductory section recognizes the importance of social and cultural aspects of fisheries by requiring that fishery management plans must "take into account the social and economic needs of the States."[10] The Act requires the councils to develop fishery management plans that assess an optimum yield (OY) of each fishery.[11] Optimum yield, by definition, is the yield which provides the "greatest overall benefit to the Nation with particular reference to food production and recreational opportunities" and which is based on the maximum sustainable yield from the fishery, as modified "by any relevant economic, social or ecological factor."[12] This definition of OY broadens the "science" of fishery management to disciplines that relate to economic, social and ecological factors. This OY definition recognizes that the "greatest overall benefit" is not necessarily measured in harvest numbers. The federal regulations on defining optimum yield suggest consideration of "enjoyment gained from recreational fishing, avoidance of gear conflicts and resulting disputes, preservation of a way of life for fishermen and fishing communities, and cultural place of subsistence fishing."[13] The National Oceanic and Atmospheric Administration's (NOAA) Operational Guidelines for the Magnuson Act also describe the content of sociological analysis to be found in Fishery Management

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[9] 16 U.S.C. 1801 et seq.

[10] 16 U.S.C. 1801(b)(5).

[11] 16 U.S.C. 1853(a).

[12] 16 U.S. C. 1802 (18).

[13] C.F.R. 602.11(f)(3)(ii).

Plans: ethnic character, family structure, community organization, age and education profiles of fishermen, employment opportunities and unemployment rates, recreational fishing, economic dependence on fishing or related activities, and distribution of income in fishing communities (Fricke 1985, 46).

National Standards

The Magnuson Act also sets forth national standards for fishery management plans.[14] National Standard four requires that allocation of fishing privileges be "fair and equitable" to all fishermen. The interpretation of fair and equitable allocation is a contentious issue in fishery management decisions. Objective decisions on allocation require an understanding of the different stakeholders in the fishery. This understanding can be augmented by socio-cultural research.

Discretionary Provisions of The Magnuson Act

In addition to the required provisions of a Fishery Management Plan and the National Standards, the Magnuson Act also lists discretionary provisions that allow the councils to establish limited entry fisheries. In so doing the councils must take into account, among other factors, "present participation in the fishery" and the "cultural and social framework" relevant to the fishery.[15]

Fishery Impact Statement

In directing the councils to develop fishery management plans, the Magnuson Act requires that each plan or amendment have a fishery impact statement which "shall assess, specify and describe the likely effects, if any, of the conservation and management measure on participants in the fisheries."[16]

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[14] 16 U.S.C. 1851(a).

[15] 16 U.S.C. 1853(b)(6).

[16] 16 U.S.C. 1853(a)(9).

B. National Environmental Protection Act

Because fishery management plans must be approved by the Secretary of Commerce, they are also subject to regulations requiring social impact assessments (SIA) under the National Environmental Policy Act of 1969 (NEPA).[17] NEPA calls for the "integrated use of the social sciences in assessing impacts on the human environment" (Interorganizational Committee on Guidelines and Principles for Social Impact Assessment 1994, 3). This requirement preceded the Magnuson Act, and the Magnuson Act incorporated these goals into its regulations (Fricke 1985, 43).

The National Marine Fisheries Service is responsible for the Social Impact Assessment (SIA) on all fishery management actions. In a 1993 memorandum to all NMFS Regional and Science directors, the NMFS assistant administrator for fisheries states,

> "...social impact assessments -- economic, social and ecological -- required by the Magnuson Act, other related laws, Executive Orders, and Agency policies and guidelines shall be developed and considered to the same extent that ecological, economic, and regulatory cost/benefit impacts are researched, analyzed, and considered by Councils, Regions, and the Washington office. Thus to be considered complete, a proposed fishery management action should include an appropriate description of the social and cultural framework of the fishery, the fishermen and dependent communities, and an assessment of the social impacts of the proposed management action and alternatives considered, including the status quo" (Schmitten 1993).

The directive also requires the NMFS regional offices to develop social science data collection and analysis plans to support fishery management planning. However, in practice there seems to be little evidence that SIAs are performed for and used by fishery management councils (Buck 1995, 7).

2.2 Information for the Councils

The Magnuson Act directs fishery management councils to use socio-cultural information in making regulatory decisions. One avenue for communication of social and cultural

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[17] 42 U.S.C. 4321-4347.

factors is public comment to the council.[18] Another way that social and cultural considerations come to be considered in management plans is through council members, who are often participants in the fisheries, and through advisory committees to the council.[19] Though input from the public, the council members, and the committees may be informative and "social," it does not satisfy the Magnuson Act requirements for *systematic* scientific study on social and cultural fishery issues. The need exists for public input *and* scientific socio-cultural studies. The councils generally need sociocultural studies for four areas: 1) *fishing effort*, 2) *allocation*, 3) *understanding* of the fishery system, and 4) the *impacts of management measures*.

To conserve fishery resources, managers determine how many fish may be harvested on a sustainable basis. Fishery managers may limit *fishing effort* to control the harvest level. Effort is a concept that encompasses biological, technical, economic and sociological factors. Typically, effort is measured in terms of days fished, number of hooks, or size of boat. However, it is important to recognize the socio-economic factors that contribute to effort, such as fishermen's motivations or local knowledge.

Fishery managers make *allocation* decisions when dividing scarce fishery resources between competing user groups. These resources may be fish, harbor space, credit for boat loans, or fish aggregation devices (FADs). According to Orbach, these allocation decisions require a "record of the mix of benefits, uses and needs which are derived or satisfied by the fishermen's activities" (Orbach 1980, 158). Large scale commercial fishermen may contribute to the local economy and to the nutritional needs of a certain area. A sport fishing industry in the same area may draw tourists and provide relaxation

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[18] The Magnuson Act states that "interested persons shall be permitted to present oral or written statements regarding the matters on the agenda at [council] meetings. 16 U.S.C. 1852(I)(2)(D).

[19] Council members must be "knowledgeable or experienced with regard to the management, conservation, or recreational or commercial harvest of fishery resources of the geographical area concerned." 16 U.S.C. 1852(b)(2)(A). Certainly council members with different backgrounds and loyalties at their best, balance, and at their worst, skew or complicate the consideration of social factors by the council. The Scientific and Statistical Committees are required to have multidisciplinary membership, "including both biological and social scientists" (50 CFR VI, 601.22[d][1]).

for its locals. A subsistence fishery may serve the local community by providing social connections, traditional hierarchy, and education for the young. The different benefits of these fisheries must be considered in allocation decisions. A prerequisite for allocating resources between different groups is understanding who those user groups are and the meaning of their fishing activities. Councils must know the categories of fishing activity.

Fishery managers also need a simple *understanding* of the fishery system. Information that satisfies the councils' needs is usually the result of "basic" research that does not address one specific management problem or decision. As Orbach notes, "all of the interactions in a fishery -- among harvesters, managers, owners, processors, scientists, consumers, and so on -- will take place more smoothly and with a better chance of satisfactory results if each participant understands the points of view, motives, goals, and constraints of the other participants" (Orbach 1980, 159). In addition to understanding participants, councils must also understand the social structure, patterns, processes, and trends in the fishery.

Finally, fishery managers want to know the impacts of their management decisions. Measures such as quotas, seasonal or area closures, or gear or vessel restrictions are often implemented to restrict fishing effort. Such restrictions may affect the people harvesting the resources, the communities where the fishing takes place and the consumer of the fish, who may be thousands of miles away. For example, quotas and closed seasons may reduce the level of income an individual receives from fishing. The commercial fisherman may turn to alternative sources of income. Widespread income reduction or closed areas change the occupational structure and activity patterns of fishing communities. Vessel and gear restrictions may increase the price the consumer pays for the final fish products. All these effects also have the potential to alter traditional and historically-valued practices associated with particular ways or patterns of fishing or consuming fish (Orbach 1980, 157). Fishery managers want to know the potential impacts of management decisions.

2.3 Basic and Applied Research

Scientific research is often thought of as either *basic* or *applied* research. Basic research tends to be conducted in universities and does not immediately address a particular authority or policy question. In contrast, applied research is conducted with a particular audience in mind, and focuses on a particular management question. Socio-cultural studies regarding the impacts of management decisions, allocation, and understanding of a fishery can be applied or basic research, depending on the relevance of the study's focus to management questions. Many socio-cultural studies have provided answers to direct management questions (Miller and Van Maanen 1979, Pollnac and Poggie 1988, Gatewood and McCay 1990, Nance et al. 1994) while many others supplement managers' general understanding of the fishery (Miller and Johnson 1981, Miller and Van Maanen 1983, Smith and Hanna 1983, Pollnac 1988). Both types of studies can be useful to fishery managers. For references and descriptions of socio-cultural studies in U.S. fisheries, see *Appendix 3: An Annotated Bibliography of Non-Economic Social Sciences Fisheries Research.* This thesis is both basic and applied research, examining basic sociological questions of work and leisure in society, and providing information related to applied fishery management issues.

2.4 The Western Pacific Regional Fishery Management Council

To provide a better understanding of the fishery, it is important to identify what the Council knows and what it wants to know about the human dimension of the Hawaii small boat troll and handline pelagic fishery. The Council's formal knowledge consists of data that are systematically collected over time, such as landings by species, revenues, catch rates, and number of boats. Table 1 lists all Pacific pelagic species for which the Council has management responsibility (Miller 1995).[20] This study is limited to fishing by trolling or handlining for these pelagic species. It excludes boats that fish for pelagics

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[20] For a description of these species see WPRFMC 1995b.

by longlining, and excludes fishing in Council jurisdictions other than the Hawaii Exclusive Economic Zone (EEZ).[21]

[21] The Council also has jurisdiction over American Samoa, Guam, the Northern Mariana Islands, and other US possessions in the Western Pacific Region (Johnston Atoll, Kingman Reef & Palmyra Island, Jarvis Island, Howland and Baker Islands, and Wake Island).

Table 1. Pacific Pelagic Management Unit Species (PPMUS)

	Common Name	Scientific Name	Hawaiian or Local Name	Season Peak
Billfish	Blue Marlin	*Makaira mazara*	A'u	May - September
	Black Marlin	*M. indica*	Kajiki, A'u	May - July
	Striped Marlin	*Tetrapturus audax*	Nairagi, A'u, A'uki	February - June
	Broadbill Swordfish	*Xiphias gladius*	Broadbill, Shutome, A'u ku	April - July
	Shortbill Spearfish	*T. angustirostris*	Hebi, A'u	June - December
	Indo-Pacific Sailfish	*Istiophorus platypterus*	A'u lepe	
Tunas	Albacore	*Thunnus alalunga*	Ahi palaha, Tombo	July - September
	Bigeye Tuna	*Thunnus obesus*	Mebachi, Ahi po'o nui	October - May
	Yellowfin Tuna	*Thunnus albacares*	Ahi, Shibi	May - September
	Northern Bluefin Tuna	*Thunnus thynnus*	Maguro	
	Skipjack Tuna	*Katsuwonus pelamis*	Aku	May - September
	Black Skipjack/ Mackerel Tuna	*Euthynnus affinis*	Kawakawa	
	Dogtooth Tuna	*Gymnosarda unicolor*	Hagatsuo	
	Frigate Tuna	*Auxis spp.*		
Sharks	Blue Shark	*Prionace glauca*		
	Mako Shark (short-fin)	*Isurus oxyrinchus*		
	Mako Shark (long-fin)	*Isurus paucus*		
	Oceanic White-tip Shark	*Carcharhinus longimanus*		
	Thresher Shark	*Alopias superciliosus*	Mano Hi'uka	
	Tiger Shark	*Galeocerdo cuvieri*		
Other Pelagics	Dolphinfish	*Coryphaena hippurus*	Mahimahi, Lapalapa	peaks in Apr. and Oct.
	Wahoo	*Acanthocybium solandri*	Ono	
	Moonfish	*Lampris spp.*	Opah	
	Oilfish	*Ruvettus pretosus*	Walu, Escolar	
	Pomfret	*Bramidae*	Manchong	

A. What the Council Knows

All data on the small boat troll and handline pelagic commercial landings and revenue come from the Hawaii State Division of Aquatic Resources (HDAR) commercial catch reporting system. Any fisherman who sells at least one fish is required to have a Commercial Marine License (CML) and file a monthly catch report with the HDAR.[22] As of June 1996, 1,837 licensed fishermen reported trolling (1,669) or handlining (168) for pelagics species to be their primary fishing method.[23] Of those 1,837, approximately 80% (1,498) fish part-time, while the other 20% (339) reported full-time status.[24] These data from HDAR only account for those fishermen who have commercial marine licenses. Because there is no state law that requires HDAR to collect recreational fisheries data, the entire "recreational" spectrum of fishermen is not accounted for in any time-series database.

Several studies have been conducted on small-boat fishing in Hawaii, specifically the catch and effort of the small boat fleet on Oahu (Hamm and Lum 1992), the fishing patterns and opinions of commercial fishermen (Harman and Katekaru 1988), and the economic value of recreational fishing (Meyer Resources 1987). Other studies have focused on charter boat fishing (Samples and Schug, 1985; Samples et al., 1984). Most recently the "Preliminary Results of the Hawaii Small-Boat Fisheries Survey"(Hamm and Lum 1992) sampled small boat fishermen at eight ports on one island, Oahu, over the course of 15 months. The survey included trolling and handlining, but also included other fishing methods, such as bottomfishing, spearing, casting, and using nets and traps. The report found that commercial fishermen (defined as those who sold at least a portion of their catch) took longer trips and caught over three times as many fish per successful trip

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[22] The Commercial Marine License costs $25 per year.

[23] For a description of pelagic fishing methods, see Rizzuto 1977, Boggs and Ito 1993, Yuen 1979, and WPRFMC 1995a.

[24] Full-time and part-time are not defined on this form, and thus there may be discrepancies in what these terms mean to different people.

as the purely recreational fishermen. In addition, the survey found that over 41% of all catch was destined to be sold (Hamm and Lum 1992, 6).

An earlier study, "Hawaii Commercial Fishing Survey" (Harman and Katekaru 1988) was conducted by the HDAR through a mail-in survey sent to all commercial marine license holders. From a response rate of 30%, the report identified several trends:

- Most commercial license holders consider themselves to be part-time or recreational.
- Most respondents own boats, and about two-thirds of them are trailered.
- Most respondents reported earning less than 50% of their income from fishing.

Another study (Meyer Resources 1987) examined the market and non-market value of fishing to the "resident" fishermen (defined as a fisherman who fishes for enjoyment, consumption, to obtain cash to defray boat expenses, and for a variety of other purposes, but not to obtain a primary source of income). The study surveyed 19 fishing clubs on the 4 main Hawaiian islands on the value of one hour's fishing, the economic value of fishing, motivations for fishing, catch rates, and perceptions of fishing issues. The study tested the viability of key respondent methods and non-market valuation to obtain quantitative data on the non-commercial fishing component of Hawaii's small boat fleet.

Currently, there are two additional survey projects underway in the fishery under the guidance of NMFS staff to examine fleet identity and vessel economics. One is an intercept survey on all islands at small boat harbors to assess the economic characteristics of troll-handline and charter boat operations, and the other is an economic valuation of recreational fishing in Hawaii.

Despite these survey approaches, there is no consistent data collection procedure that monitors the troll and handline fishing activity beyond the commercial marine license catch report database maintained by the HDAR. It is known that many who are legally considered "commercial" fishermen hold other part or full time jobs that provide the majority of their income. Likewise, the decentralization of Hawaii's seafood market

allows fishermen to easily sell their catch for a reasonable price (Pooley 1993, 16). Thus, it is suspected that there are a number of fishermen who sell at least a portion of their catch to offset costs, and yet are not licensed as commercial.[25] Although the 1992 study (Hamm &Lum) found that less than 25% of small boat trollers sold their catch, observation indicates that the number of people who catch pelagic fish and never sell is very low in Hawaii. Because it is easy to sell to the fish auction, stores, and roadside patrons, and because many of the pelagic fish are large and of high value, many people sell their catch. Because there is no bag limit, fishermen will fish opportunistically when the fish are biting and take home enough to eat, give away and sell. Although many will claim to be purely recreational, in reality it is rare to find a fisherman who will not sell catch to cover expenses on a good day fishing.

Much of the Council's time-series catch and effort data on the pelagic fishery concerns the longline fleet. This is to be expected, considering the longline fleet in 1992 landed approximately 80% of pelagic species landed in the Hawaii EEZ. In terms of the harvest, the longline fleet is a much larger fishery. However, in terms of participants, the troll and handline fleet is more than twice as large as the longline fleet; they spent some 26,600 days fishing in 1991, compared to 12,000 days of longline fishing (WPRFMC 1994b, III-16).

B. What the Council Wants to Know

As a result of these data inadequacies, the Council lacks basic information on the troll and handline pelagic fishery. The Council's Amendment Seven to the Pelagic Fishery Management Plan states:

> The troll fishery is composed of several poorly-differentiated sectors including full-time and part-time commercial trollers, commercial charter boats, and recreational and subsistence fishing....Recreational and subsistence fishermen

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[25] It is likely that the term "commercial marine license" prompts some fishermen who sell occasionally, or who sell only to cover costs, to either not realize the law, or ignore it, because they do not consider themselves commercial. Due to a small HDAR enforcement budget, there is little incentive for fishermen to obtain a license.

> sometimes operate commercially as well, in that they sell some of their catch (WPRFMC 1994b, III-21).

The Council's 1994 Annual Report cited that "the lack of long-term recreational data, lack of data on unlicensed commercial fishermen, and lack of validation of current data sets remain serious problems" (WPRFMC 1995, 3-2).

One objective of the Council's Pelagic Fishery Management Plan is to:

> Promote, within the limitations of managing at OY, "domestic harvest of, and domestic fishery values associated with PPMUS (e.g. by enhancing opportunities for satisfying recreational fishing experience, continuation of traditional fishing practices, and domestic commercial fishermen to engage in profitable operations" (WPRFMC 1995).

It is difficult for the Council to "promote" opportunities for these kinds of fishing when there is a lack of data on the user groups.

In 1992, a Pacific Pelagic Fisheries Research Workshop developed research priorities for the Council. The planning workshop report acknowledged that the "added value of the resource from recreational and cultural uses elevates the importance of the resource beyond normal commercial fishery considerations. Such social and economic factors, which are explicitly stated within definitions of optimum yield, affect the management process and decisions" (Pacific Pelagic Fisheries Planning Workshop Report 1992). The lack of knowledge about the recreational and cultural uses of the fishery was evident to the participants, and the Workshop report identified immediate social science research activities in these areas. Among the "immediate-term" high priority research activities that are pertinent to this thesis are:

> **Characterize fleet composition:** This research contributes to an understanding of what kinds of vessels or groups of vessels make up the fleet or subfleet, and characterizes the entry and exit patterns (i.e., participation rates) and fishing power of vessels or vessel classes. This analysis contributes to an understanding of the stability and competitiveness of the harvesting sector, the historical rights of various participants, and the potential impacts of various regulatory alternatives.

> **Characterize fishing communities and analyze the cultural and community dynamics related to fish and fishing:** This research looks as the inter-relationships (historical and contemporary) between primary fishing participants and their communities, as well as examining the economic, social, cultural and dietary importance of fish in local communities. This research contributes to an appreciation of the impacts of the allocation system (Pacific Pelagic Fisheries Workshop Report 1992).

In addition, the Scientific and Statistical Committee of the Council convened in 1994 to develop special cultural, social and economic research priorities. In answer to the Council's FMP priority (see above) to promote domestic fishery values, they recommended research to develop a profile of harvesting practices for recreational, traditional and commercial fishing activities, and to determine the importance and value of these activities and experiences (WPRFMC 1994a).

This thesis sets up a framework of Hawaii pelagic fishing to guide potential data-collection efforts. It also provides basic information within the PPFRP priorities of characterizing the fleet composition and analyzing cultural dynamics of the fishing experience. In addition, this thesis answers to the Council's research priorities by developing profiles of harvesting practices and exploring the importance and value of fishing activities and experiences.

3.0 TYPES OF HAWAII FISHING

People fish for pelagic fish in Hawaii with varied styles and outcomes. Because the fresh fish market in Hawaii is relatively unregulated, many people fish in hopes of economic gain from fish sales. Many people also participate for non-economic benefits, such as renewal, relaxation, or escape.[26] This chapter examines the various definitions of the terms *recreational* and *commercial* fishing, which are defined differently by different legal entities and indicate a strict dichotomy of work and leisure in fishing. I then present alternative categories that describe the types of small boat pelagic fishing in Hawaii.

3.1 Commercial and Recreational Fishing

In the world of fishing, the terms *commercial* and *recreational* differentiate between fishing activities that are undertaken for work and those undertaken for leisure. These terms are used by governmental management agencies, fishermen, and the general public. The common sense distinction between commercial and recreational fishing is that the former results in sale of catch, and the latter does not. In fact, in many U.S. fishery jurisdictions, sale of recreationally caught fish is considered not only illegal but very controversial.[27] In Hawaii, however, it is legal for any fisherman to sell his catch as long as he has a commercial marine license and files monthly catch reports. Because of the high value of the pelagic fish, many people who consider themselves recreational fishermen will sell their catch to cover expenses, blurring the traditional definitions of commercial and recreational fishing.

3.2 Defining Fishing Behavior

A. Federal Definitions

The National Marine Fisheries Service (NMFS) in 1991 began a process to standardize definitions for marine recreational and commercial fishing and fishermen. NMFS

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[26] This paper does not focus on motivations for fishing specifically. For studies of recreational fishing motivation and satisfactions, see Ditton, et al. 1978; Loomis and Ditton 1987; Ditton and Fedler 1988; Falk et al. 1989; Holland and Ditton 1992.

[27] For example, the South Atlantic Fishery Management Council is currently considering sale of bag limit recreationally caught fish, and one of the key issues is the "ethical question" of a recreational fisherman selling his catch (SAFMC 1996).

developed definitions for recreational and commercial fishing for the purpose of encouraging "consistent usage and application of these terms among the Councils, throughout the agency and within the public sector" (Schmitten 1994). The proposed definitions would require each regional fishery management council to amend its fishery management plans to incorporate the definitions. The primary impetus for this new regulation was the belief that effective management would be enhanced by standardization of categories so that the number of fishermen and their respective catches could be accurately categorized and recorded (DOC, Proposed Rule 1994). In February of 1993, the NMFS Director informed the Regional Directors that NMFS would adopt the following Marine Fisheries Advisory Committee (MAFAC) definitions based on disposition of catch:

> *Commercial Fishing*: means any fishing that results in the sale or barter of all or part of the fish harvested, with the exception of subsistence fishing as defined in paragraph (c)(1) of this section.
>
> *Marine Recreational Fishing:* means any fishing in marine waters that does not result in the sale or barter of all or part of the fish harvested, with the exception of subsistence fishing as defined in paragraph (c)(1) of this section.
>
> *Subsistence Fishing:* means any fishing for personal use, where that use is for customary and traditional subsistence purposes, and does not result in the sale of all or part of the fish harvested.

The Western Pacific Fishery Management Council recognized that the NMFS proposed definitions did not fit the unique fishing environment in Hawaii, and sent a memo presenting "functional" definitions that differed significantly from the NMFS versions. The Council's version of "commercial fisherman" is someone who derived more than 50% of his income from the capture and sale of managed fish species, while the recreational fishermen was described to have "pleasure, amusement, relaxation, or home consumption" as the *primary motivation* for fishing (emphasis added). The Council objected to the NMFS definitions because they would subject many of Hawaii's recreational fishermen to stringent reporting, insurance, and safety requirements even though they may only sell fish occasionally. The Council recognized that the distinction between recreational and commercial in its jurisdiction was not clear, with some fishermen who consider themselves recreational augmenting their income with fish sales

at a level under 50% of their income. (WPRFMC 1994).

NMFS currently has also proposed rulemaking for new definitions that include full-time and part-time commercial fisherman.

> *Full-Time Commercial Fisherman:* means any person whose primary source of earned income is from commercial fishing.
> *Part-Time Commercial Fisherman:* means any person earning income from commercial fishing whose primary source of earned income is not from commercial fishing.
> (Draft Proposed Rule for 50 CFR Part 602)

At present, however, the U.S. Congress is in the process of revising the Magnuson Act to include standard, national versions of definitions of commercial and recreational fishing that are slightly different from the executive branch (NMFS) definitions. In the most recent staff draft of the Magnuson Act amendments, the definitions read:

> The term *recreational fishing* means fishing for sport or pleasure.
> The term *commercial fishing* means fishing in which fish harvested, either in whole or in part, enter commerce through sale, barter, or trade.
> (Sustainable Fisheries Act S39, Senate Committee Draft, July 2, 1996)

Although these federal definitions are not finalized, they still separate recreational and commercial fishing by the disposition of the catch.

B. State Definitions

Hawaii's Division of Aquatic Resources (HDAR) is responsible for the issuance of commercial marine licenses and the collection of catch reports for the small boat pelagic fleet. The HDAR requires a commercial marine license and monthly catch reports from anyone who sells at least one fish in one year. Another division of the Hawaii state government, the Division of Boats and Open Recreation (DBOR), is responsible for determining the registration category of vessels under 45 feet in length. DBOR determines whether a vessel is registered as recreational or commercial based on a definition within Hawaii revised statutes that defines a commercial fisherman as someone who makes more than 50% of his income from fishing. Thus within the State Department of Land and Natural Resources, the HDAR and the DBOR have conflicting

definitions of recreational and commercial fishermen.

3.3 Types of Fishing Trips

This thesis departs from these uncertain federal and inconsistent state definitions of *recreational* and *commercial* to develop a typology that more completely describes the fishing activities in Hawaii. Because one vessel, or one fisherman, may partake in several different types of trips over the course of one year, this study will focus on the fishing *activity* that takes place. The unit of this fishing activity is a *fishing trip*. Following the framework set up by Miller's study of the social and cultural aspects of pelagic fishing in Hawaii (1995), I recognize that the fishing trip is one of three *fishing situations* that are pertinent to the study of Hawaii fisheries: *fishing trips, fish selling and sharing, and fish talk.* A trip begins when a captain begins to think of going fishing. The *trip* phase, then includes the choices of crew, target species and destination, and gear, as well as preparation of vessel, gear, ice and food. A fishing trip ends when the vessel and gear have been cleaned and stored, and the captain, crew and other participants have finished their tasks, including the distribution of catch (Miller 1995, 44). Different types of trips, then, vary in physical factors, such as boat size, gear, time spent actually fishing, logistics of trailering or tying up to a slip, and in sociological factors such as who the participants are, the relationship of those people, who else they may communicate with during the trip, and the secondary activities that may occur during the trip. All of these factors help to distinguish between different types of trips.

As discussed above, the two realms of *work* and *leisure* are often discussed in terms of *commercial* and *recreational* fishing. For this analysis, commercial and recreational fishing are manifestations of the separate realms of work and leisure. I depart from the legal meanings of these terms and rely on common sense definitions. *Commercial* is defined in the dictionary as "of or engaged in commerce" and "having profit as a chief aim." *Recreation* is defined as "refreshment of one's mind or body through activity that

amuses or stimulates."[28] Thus, any fishing trip with income as its chief aim is commercial and any fishing trip that attempts to stimulate, refresh or amuse is recreational.

The classification of Hawaii fishing is a complex task. If these categories are to enhance understanding of the fishery, they must be categories that make sense to the various groups in the Hawaii fishing scene. In describing socially meaningful behavior systems, anthropologists distinguish between language that is *emic*, based on elements within the system being studied, or *etic*, based on conceptual elements that are not components of the system (Goodenough 1981, 16). The emic terminology is that of the insider, or native to the system, while the etic terminology is that of the outsider, or scientist describing the system. The federal definitions of commercial and recreational are etic language. There also exists an emic language that Hawaii fishermen use to describe their activities. The incompatibility of these two language systems is illustrated by the Hawaii fisherman, who, when asked if he were a commercial fisherman, replied, "No, I'm not commercial. I just fish for a living." The categories of fishing in Table 2 attempt to accommodate both the emic and etic language, using terms that Hawaii pelagic fishermen might use that are also easily understood by outsiders.

As Smith notes, categories must be developed carefully, because incorrect splitting or lumping of a set to be analyzed can be like comparing peaches and pears, or "comparing the incomparable" (Smith, 9). Her study of the occupational sub-culture of deep water seamen and "lakemen" recognizes the need for anthropological models to be flexible. A rigid categorization of fishing trips would prevent consideration of similarities between types and consideration of the activity as a whole. Collection of data from a flawed typology results in useless conclusions. It is with this in mind that I propose the typology in Table 2 as a preliminary way of ordering the many types of fishing trips in the Hawaii

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[28] American Heritage Dictionary, Third Edition (1994).

pelagic fishery. It is important to realize that Hawaii fishermen, at different times and in different situations, may take many different types of trips.

Within the realm of commercial fishing, there is profit fishing and charter fishing. These types of fishing trips intend to make money. Within the realm of recreational fishing, there is expense fishing, sport fishing and *holoholo*[29] fishing. These fishing trips may make money, but the intention of the trip is to relax, amuse, challenge, or enjoy nature. The uncertainty of fishing means that some trips intend to be one type of trip and yet end up resembling a different type of trip. For example, a sport fishing trip may end up looking like an expense trip if enough marketable fish are caught. Conversely, a profit trip on a slow day can resemble an expense trip. However, the type of a fishing trip is not determined by how much fish were caught and how much money they fetched at the market. The type of trip depends on how the trip was experienced by each fisherman, and what the intentions, attitudes, and relationships were of the people involved in the trip. The amount or disposition of catch does not determine the type of fishing trip.

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[29] *Holoholo* is a Hawaiian word meaning, "to go for a walk, ride, or sail; to go out for pleasure, stroll, promenade" (Pukui and Elbert 1986).